MULTIMEDIA UNIVERSITY

FINAL EXAMINATION

TRIMESTER 1, 2017/2018

BBF3124 – FINANCIAL DERIVATIVES
(All sections / Groups)

27th OCTOBER 2017
3:00 PM – 5:00 PM
(2 Hours)

INSTRUCTIONS TO STUDENT

1. This Question paper consists of 5 pages with two (2) parts: PART A (3 Questions)
   PART B (2 Questions)

2. Answer ALL questions in PART A and any one (1) question in PART B.

3. The distribution of the marks for each question is given at the end of each question.

4. Please write all your answers in the Answer Booklet provided. Start each answer on a new page.

PART A – ANSWER ALL QUESTIONS

QUESTION 1

a)   The presence of derivative market serves to provide three (3) basic economic functions. Briefly explain the **THREE (3)** functions.

(6 marks)

b)   Briefly explain the importance of arbitrageurs in the derivatives market.

(4 marks)

c)   Mr. Bob is a professional trader in derivatives market. Through his experience, he believes that FBM KLCI and FKLI are mismatched significantly for November 2016 prices. Today, in August, the quotation of KLCI is at 1820 while November 2016 FKLI at 1875. Risk-free rate is at 7.5% per annum and expected dividend yield is 5.3%. At maturity on the last day November, both prices converged at 1888. Mr Bob needs your help to establish his arbitrage activity by showing him an arbitrage profit, if any.

(15 marks)

(Total: 25 marks)

QUESTION 2

a)   Briefly describe **THREE (3)** the necessary conditions for a hedge to be perfect.

(6 marks)

b)   Mr. Adudu, the treasurer of Eastwest Finance Corporation has just determined that there will be a RM200 million shortage of fund for the company in three (3) months' time. That amount will have to be raised in the interbank market. Eastwest's cost of fund is normally at the KLIBOR rate. Mr. Adudu is however worried about the potential interest rate risk. Assuming the following quotations are available now:

1-month KLIBOR	3.8%
3-month KLIBOR	4%
Spot-month KLIBOR futures	96
3-month KLIBOR futures	97

Continued...

i) Determine the interest rate that Mr. Adudu should aim to 'lock in'?

(2 marks)

ii) Outline clearly the hedge strategy that he should implement?

(4 marks)

iii) Assuming the spot 3-month KLIBOR is higher by 1.5% three (3) months later and that the spot and futures market converge, analyse the hedge and show that by using your strategy, the locked-in interest rate has been achieved (effective interest rate).

(13 marks)

(Total: 25 marks)

QUESTION 3

a) Briefly discuss any **THREE (3)** reasons why corporations use options as their hedge strategies?

(9 marks)

b) TC Berhad shares are currently at RM7.50. 3-month call and put options with RM7.50 exercise piece are being quoted at RM0.38 and RM0.10 respectively. The risk free rate is 12% per annum.

i) Using Put-Call parity, prove that there is mispricing.

(4 marks)

ii) Identify the security that is mispriced relative to the others.

(3 marks)

iii) Outline the arbitrage strategy and show the arbitrage assuming you invested in one (1) lot/ contract.

(5 marks)

iv) Graph the overall position.

(4 marks)

(Total: 25 marks)

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PART B – ANSWER ONE (1) QUESTION ONLY

QUESTION 1

a) Given a stock price is valued at RM25 and the price can move up and down by 15% over 1-period. You believe the probability of an up movement should be 70%. The risk free interest rate is 10%. By using one-period binomial option pricing model, determine:

    i)   The possible stock price for next period.

(5 marks)

    ii)   The intrinsic values given the strike price is RM25.

(4 marks)

    iii)   The value of the option.

(6 marks)

b) Identify which variable under the Black Scholes Option Pricing model is the most critical and explain the reasons why.

(6 marks)

c) One of the assumptions of Black Scholes Option Pricing model is no dividend. Explain how to adjust for dividend in this model.

(4 marks)

(Total: 25 marks)

QUESTION 2

a) TUAH stock is now trading at RM28.00. The stock has price volatility (standard deviation) of 30%, and is expected to pay a dividend of RM2.50 per share three months from now (90 days).

Determine the correct value of a put option on the stock given the following information.

Maturity   =   180 days
Interest rate (risk free)   =   12%
Exercise price   =   RM25.00

(10 marks)

Continued...

b)   Fill in the blanks to show the impact on option price. A (+) to show an *increase in option value, a* (-) for *decrease* and (?) for *ambiguous value.*

		Value of Option	
		Call	Put
i)	A company announces a cut in forthcoming dividends.		
ii)	Given rumours of an impending merger, a company's underlying stocks becomes more volatile.		
iii)	Bank Negara Malaysia announces a cut in interest rates.		
iv)	In line with the current bullish trend, the stock increases in value.		
v)	The Securities Commission allows a company to extend the maturity period on its outstanding stock options.		

(10 marks)

c)   The stock price has an opposite impact on calls and puts. Explain why stock price has a differential impact on calls versus puts.

(5 marks)

(Total: 25 marks)

Continued...

Table: Cumulative Normal Distribution

d	$N(d)$	d	$N(d)$	d	$N(d)$	d	$N(d)$	d	$N(d)$	d	$N(d)$
-3.00	.0013	-1.58	.0571	-0.76	.2236	0.06	.5239	0.86	.8051	1.66	.9515
-2.95	.0016	-1.56	.0594	-0.74	.2297	0.08	.5319	0.88	.8106	1.68	.9535
-2.90	.0019	-1.54	.0618	-0.72	.2358	0.10	.5398	0.90	.8159	1.70	.9554
-2.85	.0022	-1.52	.0643	-0.70	.2420	0.12	.5478	0.92	.8212	1.72	.9573
-2.80	.0026	-1.50	.0668	-0.68	.2483	0.14	.5557	0.94	.8264	1.74	.9591
-2.75	.0030	-1.48	.0694	-0.66	.2546	0.16	.5636	0.96	.8315	1.76	.9608
-2.70	.0035	-1.46	.0721	-0.64	.2611	0.18	.5714	0.98	.8365	1.78	.9625
-2.65	.0040	-1.44	.0749	-0.62	.2676	0.20	.5793	1.00	.8414	1.80	.9641
-2.60	.0047	-1.42	.0778	-0.60	.2743	0.22	.5871	1.02	.8461	1.82	.9656
-2.55	.0054	-1.40	.0808	-0.58	.2810	0.24	.5948	1.04	.8508	1.84	.9671
-2.50	.0062	-1.38	.0838	-0.56	.2877	0.26	.6026	1.06	.8554	1.86	.9686
-2.45	.0071	-1.36	.0869	-0.54	.2946	0.28	.6103	1.08	.8599	1.88	.9699
-2.40	.0082	-1.34	.0901	-0.52	.3015	0.30	.6179	1.10	.8643	1.90	.9713
-2.35	.0094	-1.32	.0934	-0.50	.3085	0.32	.6255	1.12	.8686	1.92	.9726
-2.30	.0107	-1.30	.0968	-0.48	.3156	0.34	.6331	1.14	.8729	1.94	.9738
-2.25	.0122	-1.28	.1003	-0.46	.3228	0.36	.6406	1.16	.8770	1.96	.9750
-2.20	.0139	-1.26	.1038	-0.44	.3300	0.38	.6480	1.18	.8810	1.98	.9761
-2.15	.0158	-1.24	.1075	-0.42	.3373	0.40	.6554	1.20	.8849	2.00	.9772
-2.10	.0179	-1.22	.1112	-0.40	.3446	0.42	.6628	1.22	.8888	2.05	.9798
-2.05	.0202	-1.20	.1151	-0.38	.3520	0.44	.6700	1.24	.8925	2.10	.9821
-2.00	.0228	-1.18	.1190	-0.36	.3594	0.45	.6773	1.26	.8962	2.15	.9842
-1.98	.0239	-1.16	.1230	-0.34	.3669	0.48	.6844	1.28	.8997	2.20	.9861
-1.96	.0250	-1.14	.1271	-0.32	.3745	0.50	.6915	1.30	.9032	2.25	.9878
-1.94	.0262	-1.12	.1314	-0.30	.3821	0.52	.6985	1.32	.9066	2.30	.9893
-1.92	.0274	-1.10	.1357	-0.28	.3897	0.54	.7054	1.34	.9099	2.35	.9906
-1.90	.0287	-1.08	.1401	-0.26	.3974	0.56	.7123	1.36	.9131	2.40	.9918
-1.88	.0301	-1.06	.1446	-0.24	.4052	0.58	.7191	1.38	.9162	2.45	.9929
-1.86	.0314	-1.04	.1492	-0.22	.4129	0.60	.7258	1.40	.9192	2.50	.9938
-1.84	.0329	-1.02	.1539	-0.20	.4207	0.62	.7324	1.42	.9222	2.55	.9946
-1.82	.0344	-1.00	.1587	-0.18	.4286	0.64	.7389	1.44	.9251	2.60	.9953
-1.80	.0359	-0.98	.1635	-0.16	.4365	0.66	.7454	1.46	.9279	2.65	.9960
-1.78	.0375	-0.96	.1685	-0.14	.4443	0.68	.7518	1.48	.9306	2.70	.9965
-1.76	.0392	-0.94	.1736	-0.12	.4523	0.70	.7580	1.50	.9332	2.75	.9970
-1.74	.0409	-0.92	.1788	-0.10	.4602	0.72	.7642	1.52	.9357	2.80	.9974
-1.72	.0427	-0.90	.1841	-0.08	.4681	0.74	.7704	1.54	.9382	2.85	.9978
-1.70	.0446	-0.88	.1894	-0.06	.4761	0.76	.7764	1.56	.9406	2.90	.9981
-1.68	.0465	-0.86	.1949	-0.04	.4841	0.78	.7823	1.58	.9429	2.95	.9984
-1.66	.0485	-0.84	.2005	-0.02	.4920	0.80	.7882	1.60	.9452	3.00	.9986
-1.64	.0505	-0.82	.2061	0.00	.5000	0.82	.7939	1.62	.9474	3.05	.9989
-1.62	.0526	-0.80	.2119	0.02	.5080	0.84	.7996	1.64	.9495		
-1.60	.0548	-0.78	.2177	0.04	.5160						

This table shows the probability [N(d)] of observing a value less than or equal to d. For example, as illustrated, if d is −.24, then N(d) is .4052.

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